

MONEY-TRANSFER TECHNIQUESPRIORITY CLAIM

This application claims priority of
co-pending United States provisional patent application
5 entitled "MONEY TRANSFER TECHNIQUES", filed January 5,
2000, and assigned serial number 60/174,646, which is
incorporated by reference herein.

BACKGROUND OF THE INVENTION

10 A. Field of the Invention

The present invention relates generally to
techniques, specifically apparatus and accompanying
15 methods, of conducting financial transactions, and
particularly to commercial systems for transferring
money and executing related monetary functions between
multiple remotely located parties.

20 B. Description of the Prior Art

Financial firms have used a variety of
processes for transferring money between a customer and
a beneficiary. In a typical money transfer process, a
25 customer would visit the facilities of a selling agent
who is part of or associated with a financial firm.
The customer would normally be asked to complete a form
giving information such as the amount to be
transferred, and the customer's and beneficiary's

names, addresses, telephone numbers, etc. A customer would then submit a completed form to the transfer agent along with a payment, usually in cash, or via a credit card, certified check, or the like. The payment would usually include at least the transfer amount plus a transaction fee. The selling agent would then transmit appropriate information to the facilities of a paying agent where the beneficiary can readily collect the transferred funds.

Those concerned with the development of such processes have long recognized the need for reducing the time and effort required to execute a money transfer, while still maintaining a sufficiently high degree of security from threats, such as fraud, theft, third-party interception with redirection and interference of payment information.

In many prior-art systems, selling agents perform some steps with due speed and security. For instance, once a customer's transaction details and funds are processed, most selling agents can promptly initiate the transaction by electronically transmitting instructions to an appropriate agency. Such transmissions normally occur over e.g., a telephone network. Typically, the customer or agency would inform the beneficiary, e.g., via a telephone, that the funds are available for delivery at a paying agent's facility. The beneficiary, who, in fact, may have been waiting at a paying agent's facility for the transfer, would present proper identification, e.g., a driver's

license, passport, etc., to the paying agent. After reviewing the beneficiary's identification, the paying agent would then make the payment.

5 Although most prior-art processes can execute
a money transfer within a reasonably short time, these
processes still require considerable time and effort on
the part of the customer and the agents. For instance,
most money-transfer processes require that, for every
10 requested transaction, a customer complete long,
involved forms that demand considerable time and effort
to complete properly. In addition, selling agents must
review the customer's forms in detail and then manually
input the customer's data for transmission to an
15 appropriate agency.

Hence, a need exists in the art for a money
transfer system that is significantly easier and
quicker to use by both transferring parties and
20 beneficiaries.

SUMMARY OF THE INVENTION

25 The present invention relates to a method of
transferring money from a customer to a beneficiary
that advantageously overcomes the deficiencies of
conventional money transfer technologies known in the
art.

30 In accordance with the invention,
money-transfer devices, specifically transaction cards,

are first distributed to a plurality of customers. Each money-transfer device is equipped with a unique device code. Next, a device database is created which comprises a set of device records in which each of the
5 unique device codes is loaded into a different corresponding one of the device records. Customer data, identifying each customer who holds, e.g., a transaction card, (transferring party) along with accompanying beneficiary data, as specified by that
10 customer, is written into the device records associated with the device code of that specific transaction card. Thereafter, the customer actually initiates a transfer of a particular amount of money from that customer to his (her) beneficiary, using, for example, a
15 transaction card.

A more particular aspect of the invention is directed to a technique for transferring money between a customer and a beneficiary via a system comprising a
20 money-transfer company, and a plurality of selling agents and paying agents. The money-transfer company includes a host computer, a database storage device, and a communications interface for communicating, via a telephone network and/or the Internet, with data
25 terminals or client computers located at the selling and paying agents' sites. Customer transaction cards, distributed to customers by the selling agents, contain a visible card number and an alphanumeric card code stored in a magnetic strip. By customer request, the
30 money-transfer company activates the customer's transaction card and at the same time loads the

customer and beneficiary information into a
corresponding transaction card record stored in the
database storage device. A selling agent initiates a
money-transfer request from a data terminal by keying
5 in a money amount and swiping the customer's card in a
magnetic strip reader located on the data terminal.
Upon receiving the money amount and the customer's card
code, the company creates a corresponding transaction
record in the database storage device and returns a
10 fund-pick-up number ("folio" number) to the customer.
The customer discloses the fund-pick-up number to the
beneficiary. Using the fund-pick-up number and
appropriate personal identification, the beneficiary
collects the transferred money from a paying agent.
15 The customer can subsequently re-use the transaction
card to request subsequent money transfers, in any
amount, to the same beneficiary, each transfer being
accorded a different and unique folio number.

20 BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 depicts a high-level schematic diagram
of a money-transfer system 10 in accordance with the
present invention;

25 FIG. 2 schematically illustrates transaction
data 27 stored as a set of transaction records T1-Tq
for use in the system of FIG. 1;

FIG. 3 schematically illustrates transaction card data 28 as a set of transaction card records C1-Cr for use in the system of FIG. 1;

5 FIG. 4 depicts a front view of transaction card 95 for use with system 10 shown in FIG. 1;

FIG. 5 depicts a rear view of transaction card 95 illustrated in FIG. 4;

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FIG. 6 depicts a flow diagram illustrating a card distribution and activation process 39, which embodies the teachings of the present invention;

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FIG. 7 depicts a flow diagram illustrating money-transfer process 100 in accordance with the present invention;

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FIG. 8 depicts a flow diagram illustrating fund-pick-up process 130 in accordance with the present invention;

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FIG. 9 depicts a high-level block diagram of illustrative client computer 21 located at either a selling or paying agent;

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FIG. 10 depicts a high-level block diagram of the software processes utilized by the present invention in a client-server embodiment with PSTN-based communication occurring between an agent and server 11;

FIG. 11 depicts a high-level block diagram of the software processes utilized by the present invention in a client-server embodiment but with web-based communication occurring between an agent and server 11; and

FIG. 12 depicts a high-level block diagram of typical server farm 1200 for use in lieu of server 11, shown in FIG. 11, for processing large numbers of simultaneously occurring web-based financial transactions.

DETAILED DESCRIPTION

In general, the money-transfer techniques, described below in detail, enable remotely located selling and paying agents, associated with a money-transfer company, to transfer money from a customer to a beneficiary. A selling agent inputs an amount to be transferred and a customer's transaction code, stored on a passive magnetic "transaction" card via a data terminal that operates either in a stand-alone environment of a selling agent or in conjunction with a client computer co-located thereat. The transaction code corresponds to customer information and beneficiary information stored by the money-transfer agent (i.e., a financial institution). The customer is given a fund-pick-up code (hereinafter also referred to as a "folio" number), which the customer discloses to the beneficiary for use by the latter for claiming the funds at a paying agent.

Use of a passive transaction card is mainly illustrative. Those skilled in these arts will recognize that the invention is applicable to use with other articles, such as a so-called "smart card", which can be separately coded for a given user and which permits use of encoded security information stored internal to the article and which can be "swiped" through a reader or electronically or optically scanned to initiate a transaction. However, for ease of understanding and simplicity of the following description, the invention will now be described in the context of use with a credit-card type transaction card.

FIG. 1 illustrates money-transfer system 10 comprising money-transfer company 12 (also referred to as a "financial institution"), "n" selling-agent sites S1-Sn and "m" paying-agent sites P1-Pm (where n and m are integers, typically numbering in the thousands, if not larger). Each of the selling-agent sites S1-Sn includes a conventional data transmit-receive (point of sale -- POS) terminal 14, which comprises standard magnetic strip ("swipe") card reader 15, keypad 16, printer 18, display 17 and an internal modem (not shown). Sites S1-Sn may also comprise client computer 21, preferably a conventional personal computer (PC), to which associated swipe card reader 43 may also be connected, via connection 41 (for simplicity, the above described connection is shown at only one of the selling agents sites, e.g., site S2). The POS terminals and client computers (with or without

swipe card readers) are typically stand-alone devices. Client computer 21 includes display 22, keyboard 23, mouse 24 and printer 25. Paying-agent sites P1-Pm also include client computer 21 having display 22, keyboard 23, mouse 24 and printer 25. Client computers 21 connect to Internet 30 through conventional communications equipment (not specifically shown). Terminals 14 connect to server 11 via PSTN (public switched telephone network) 19. As described below, transactions involving any agent can occur either over the PSTN or through a web-based Internet connection, depending upon the communication facilities available at that agent. For simplicity, we will assume that selling agents utilize either a telephone and/or web-based connection, while paying agents utilize the latter.

Server 11 (which is described in greater detail below in conjunction with FIGs. 10-12), located at the facilities of financial institution 12, comprises computer 31, database 32 and communications interface 33. Server 11 connects to PSTN 19 and Internet 30 via communications interface 33. Communications interface 33, which is conventional, provides server 11 with a standard modem connection to PSTN 19 and generally a full-time dedicated connection to Internet 30. Database 32 stores money-transfer data, including transaction data 27 and transaction card data 28 as illustrated in FIGs. 2 and 3, respectively. Transaction data 27 comprise a set of "q" transaction records T1-Tq. Transaction card

data 28 comprise a set of "r" transaction card records C1-Cr.

As shown in FIG. 2, the transaction records T1-Tq comprise the following data in the indicated data fields shown in Table 1 as follows.

Field 40 - CARD CODE
Field 41 - CARD NUMBER
Field 42 - TRANSACTION NUMBER
Field 43 - TRANSACTION DATE
Field 44 - TRANSACTION TIME
Field 45 - CONTROL NUMBER
Field 46 - FUND-PICK-UP NUMBER
Field 47 - TRANSFERRED AMOUNT
Field 48 - TRANSACTION FEE
Field 49 - TOTAL AMOUNT
Field 50 - EXCHANGE RATE
Field 51 - FUND-PICK-UP AMOUNT
Field 52 - STATUS
Field 53 - SELLING AGENT (Transaction)
Field 54 - PAYING AGENT
Field 55 - CUSTOMER'S Name, Address,
Telephone Number and Currency
Field 56 - BENEFICIARY'S Name, Address,
Telephone Number and Currency
Field 57 - PICK-UP DATE
Field 58 - PICK-UP TIME

TABLE 1 - TRANSACTION RECORD FIELDS

With reference to FIG. 3, the transaction card records C1-Cr comprise the following data in the data fields shown in Table 2 as follows.

Field 60 - CARD CODE
Field 61 - CARD NUMBER
Field 62 - SELLING AGENT (Distribution)
Field 63 - DISTRIBUTION FLAG
Field 64 - ACTIVATION FLAG

Field 65 - CUSTOMER'S Name, Address,
Telephone Number and Currency
Field 66 - Beneficiary's Name, Address,
Telephone Number and Currency

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TABLE 2 - TRANSACTION CARD RECORDS FIELD

Server 11 initially creates transaction card records C1-Cr by loading a specific CARD CODE and CARD
10 NUMBER into respective fields 60 and 61. In addition, DISTRIBUTION FLAG (field 63) and ACTIVATION FLAG (field 64) are initially reset to indicate that the corresponding transaction card 95 is a non-distributed, non-activated card.

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As will become clear from the following description and with reference to FIGs. 4 and 5, each of the transaction card records C1-Cn corresponds to a unique transaction card 95. In addition, each of the
20 transaction records T1-Tq (also referred to as a "folio") is associated on a 1:1 basis with only one of the transaction card records C1-Cn. However, transaction card records C1-Cn can be associated (on a k:1 basis where $k \geq 1$) with any number of transaction
25 records T1-Tq.

FIG. 6 illustrates transaction card distribution and activation process 39. Financial institution 12 performs a portion of this process
30 (shown in the left side of this figure). The remainder of process 39 (shown in the right side of this figure) is performed by each of the selling agents S1,..., Sn, at its respective site.

Transaction card distribution and activation process 39 begins with acquire-cards step 80. Through step 80, institution 12 acquires, from a card manufacturer or the like, a number of "generic" transaction cards 95 (see FIGs. 4 and 5) (i.e., "generic" in the sense of not having any customer records or beneficiary data associated therewith). Transaction cards 95 are preferably durable plastic cards similar, in size, shape and configuration, to a conventional credit card. Each such transaction card is stamped (typically embossed) with card number 96 (see FIG. 4), visible from the card front and corresponding to a CARD NUMBER (field 61) (see FIG. 3). The back of transaction card 95 includes conventional signature strip 98 and magnetic strip 99. Magnetic strip 99 is encoded with a unique alphanumeric card code corresponding to a CARD CODE (field 60) (see FIG. 3).

Server 11, at institution 12, initially loads each card number 96 into CARD NUMBER (field 61) and each corresponding magnetically stored card code into CARD CODE (field 60). This can done, most likely, through computer download of the information from, e.g., a card supplier (such as the card manufacturer) to the financial institution at the time a batch of cards are manufactured, by supplying a magnetic tape or diskette (or other media) containing that information for subsequent download by the institution once the cards are delivered to it, or subsequently when the cards are distributed by the selling agents to their

respective customers. In addition, for each card 95, computer 31 resets DISTRIBUTION FLAG (field 63), indicating that a selling-agent has not yet received the corresponding transaction card or, in the case of a transaction card record being instantiated when that card is distributed to its customer, the distribution flag is set at the time that record is created. Further, host computer 31 resets ACTIVATION FLAG (field 64), indicating that the corresponding card 95 is a non-activated card.

In distribute-to-agent step 81, institution 12 distributes non-activated transaction cards 95 to a number of selling agent sites S1-Sn. Selling agents distribute one or more non-activated transaction cards 95 to customers, in distribute-to-customer step 85. Since these cards are not activated, the selling agents do not need to distribute the cards in a secure manner.

After receiving cards 95, in step 82, the selling agents transmit card data for each card 95 to server 11, via transmit step 83. Specifically, a selling agent enters the selling agent's ID, via keypad 16, and simply swipes each card 95 through a magnetic strip reader 15 on terminal 14 at the time the cards have been distributed to their respective customers (users). Terminal 14 transmits a card code and the selling agent's ID to server 11, via PSTN 19. For those agents that have Internet access and also a swipe card reader, the information provided by the

swipe reader can be routed through the client computer to appropriately populate an "activation" web page provided by a transaction server at institution 12 and then send the data on the populated page to that server for use in updating database 32. In any event, through record-data step 84, server 11 receives the card data and accesses the card record, from card records C1-Cr previously stored in database 32, that corresponds to the received card code. For the retrieved card record, server 11 sets DISTRIBUTION FLAG (field 63), indicating that a customer has received the corresponding transaction card, and loads the selling agent's ID into SELLING AGENT field (field 62).

When a customer first receives a transaction card, that card already has a corresponding record established in database 32. However, the customer cannot use the transaction card 95 until the corresponding card record C1-Cr indicates that the card is activated. Server 11 activates card 95 by setting the corresponding ACTIVATION FLAG (field 64). In addition, the record must also contain customer and beneficiary information as CUSTOMER DATA (fields 65) and BENEFICIARY DATA (field 66).

A selling agent requests activation of a transaction card 95 via his or her client computer 21 and Internet 30. To do so, that selling agent begins by establishing an internet connection to a web site maintained by institution 12, which provides a transaction card activation web page for display at a

browser executing at the agent's client PC. The agent then accesses, through the site, a record of a card based on the unique card number associated with that card, from database 32, in access-records step 86 via
5 server 11. Using client computer 21, the selling agent enters a transaction card number 96, provided by a customer, into the page and sends an HTTP (hypertext transfer protocol) request containing this number, from the browser trail to the web server. In response, a
10 copy of the appropriate record, say transaction card record C1, is transmitted, in transmit-record step 87, as an HTML file that displays, via the agent's browser and on a subsequent web page, on the selling agent's monitor 22. Using the selling agent's keyboard 23 and
15 mouse 24, the selling agent, in enter-data step 88, enters customer and beneficiary data into the web page then displayed on monitor 22. Specifically, the customer's name, address, telephone number and currency (e.g., U.S. Dollars) are entered into appropriate
20 locations in the page. In addition, the selling agent enters the beneficiary's name, address, telephone number and currency (e.g., Mexican Pesos). After entering all of the necessary data, the selling agent transmits, in transmit-data step 89, the resulting page
25 through the browser, as an HTTP request, to server 11 (see FIG. 1) at institution 12. This page includes an instruction, issued by agent depression of or clicking on an associated "button" or other user-activated hypertext field (commonly called a "widget") displayed
30 on that page which prompts a request to activate the corresponding transaction card.

Server 11 receives the HTTP request, in receive-data step 90 (see FIG. 6), and through activate-card step 91, activates the appropriate card record, e.g., transaction card record C1.

5 Specifically, server 11 sets an ACTIVATION FLAG (field 64), and loads the customer's and beneficiary's names, addresses, telephone numbers and currencies in the respective fields 65 and 66.

10 Thus, at this stage, the transaction card record, e.g., transaction card record C1, which corresponds to the customer's transaction card 95, holds a set of parameters that defines, except for the transaction amount, a distinct unique transaction
15 between a particular customer and a particular beneficiary. Consequently, a selling agent can initiate a money transfer by simply entering a selling agent ID and a transaction amount, via keypad 16, and then swiping the customer's card 95 in magnetic strip
20 reader 15.

FIG. 7 depicts money-transfer process 100. Institution 12 performs a portion of this process (shown in the left side of this figure), while the
25 selling agents, S1-Sn, performs the steps located in the center of FIG. 7. Finally, the customers wishing to transfer money to a beneficiary perform the steps located in the right side of FIG. 7.

30 Money-transfer process 100 commences with customer-request step 101. In step 101, a customer

with a previously activated transaction card 95 visits a selling agent's site, e.g., site S2, to arrange a money transfer to a beneficiary. The customer presents a transaction card 95 to the selling agent and pays the selling agent an amount that includes the amount to be transferred and a transaction fee.

In input-data step 102, a selling agent enters money-transfer request data via keypad 16 and magnetic strip reader 15 on terminal 14. Specifically, the selling agent keys in its selling agent ID and a transaction amount via keypad 16, and then swipes transaction card 95 through magnetic strip reader 15 to enter the card code of that card. In input-data step 102, terminal 14 transmits the selling agent's ID, the amount and the card code to server 11 via PSTN 19 (or, as discussed above, through an appropriate web page provided by server 11 through an Internet connection).

Upon receiving the transaction request, in receive-data step 103, server 11 creates one of the transaction records T1-Tq, e.g., transaction record T1. Thus, in create-record step 104, server 11 begins by creating unique transaction and control numbers. Server 11 then enters the transaction number into TRANSACTION NUMBER (field 42), the control number into CONTROL NUMBER (field 45), the card code into CARD CODE (field 40), and the selling agent's ID into SELLING AGENT (field 53). In addition, server 11 enters a transaction status code, e.g., "OPEN", into STATUS

(field 52), to indicate that the corresponding transaction is an open transaction. Further in create-record step 104, using the card code received in step 103, server 11 searches transaction card records C1-Cr for a card record with a matching CARD CODE (field 60).

Upon finding a match, server 11 copies data from the matching transaction card record, e.g., record C1, to the transaction record being created, e.g., record T1. Specifically, server 11 copies CARD NUMBER from field 61 to field 41, CUSTOMER DATA from field 65 to field 55 and BENEFICIARY DATA from field 66 to field 56. Next, computer 31 calculates and enters TRANSACTION FEE (field 48), TRANSFERRED AMOUNT (field 47), FUND-PICK-UP AMOUNT (field 51), using, if necessary, EXCHANGE RATE (field 50), and TOTAL AMOUNT (field 49). Finally, server 11 enters TRANSACTION DATE (field 43) and TRANSACTION TIME (field 44) with the current date and time. Computer 31 leaves blank the PAYING AGENT (field 54), PICK-UP DATE (field 57) and PICK-UP TIME (field 58), which are filled in when the beneficiary picks up the funds.

If no match occurs or a data error results during execution of create-record step 104, as determined in decision step 105, server 11 returns an error message to the selling agent in send error message step 106. The selling agent receives the error message, in receive-error message step 107, as an image on display 17 (if the terminal is being used) and/or as

an HTML file rendered by the browser executing at client computer 21 (if web access is being used). In those instances where the customer wishes to try again, the process exits the YES path of decision step 108 and returns to request step 101. Otherwise, the process terminates via a NO path of decision step 108 to end step 109.

If no data errors occurred, then process 100 advances, via a YES path of decision step 105, to load-record step 113. In load-record step 113, server 11 loads the transaction record created in create-record step 104, e.g., transaction record T1, into database 32. Next, in issue-receipt step 114, server 11 issues a money-transfer receipt in the form of a data transmission to the selling agent at, for example, selling-agent site S2. Upon receiving the money-transfer receipt data, the selling agent's terminal 14 prints a transaction receipt via terminal printer 18. In this regard, FIG. 1 shows printer 18 at selling-agent site S2 printing a transaction receipt in the form of printed slip 18'. Printer 18 prints at least two copies of the transaction receipt (printed slip 18'), which the customer signs. The selling agent retains a copy, while giving the customer a copy, in receive-receipt step 119.

A preferred transaction receipt contains the following information, as shown in Table 3 below:

5 FINANCIAL INSTITUTION'S
 NAME, ADDRESS AND TELEPHONE NUMBER
 SELLING AGENT'S
 NAME, ADDRESS AND TELEPHONE NUMBER
 CARD NUMBER
 TRANSACTION NUMBER
10 TRANSACTION DATE
 TRANSACTION TIME
 CONTROL NUMBER
 FUND-PICK-UP NUMBER
 IN CUSTOMER CURRENCY (e.g., US Dollars):
15 TRANSFERRED AMOUNT
 TRANSACTION FEE
 TOTAL AMOUNT
 IN BENEFICIARY CURRENCY (e.g., Mexican
 Pesos):
20 FUND-PICK-UP AMOUNT
 EXCHANGE RATE
 CUSTOMER'S
 NAME, ADDRESS AND TELEPHONE NUMBER
 BENEFICIARY'S
25 NAME, ADDRESS AND TELEPHONE NUMBER
 CUSTOMER'S SIGNATURE

TABLE 3 - TRANSACTION RECEIPT

30 Upon receiving the transaction receipt in
receive-receipt step 119, the customer contacts the
beneficiary in inform-beneficiary step 120. The
customer informs the beneficiary of the fund-pick-up
("folio") number and amount, by, for example, a
35 telephone call, an e-mail message, or a facsimile
transmission.

FIG. 8 illustrates fund-pick-up process 130.
Institution 12 performs the steps located in the left
40 side of FIG. 8, while each of the paying agents,

at P1-Pm, performs the steps located in the center of FIG. 8. Finally, the beneficiary performs the steps located in the right side of FIG. 8.

5 In claim-funds step 131, a beneficiary claims funds from a paying agent by presenting a folio number and proper personal identification, preferably a photo ID such as a driver's license, passport, etc. After reviewing the customer's identification, in review-ID
10 step 132, the paying agent uses the folio number to access a copy of the corresponding transaction record, e.g., transaction record T1, from institution 12. Specifically, using Internet 30 and the paying agent's client computer 21, in input step 133, the paying agent
15 establishes an Internet connection to server 11 to obtain a "payment" page. Through this page, the agent inputs the folio number that the beneficiary provided.

20 The paying agent transmits, through its browser and as an HTTP request, the request in access-record step 134. Server 11 responds, via Internet 30, in transmit-record step 135 with a web page providing payment authorization, including the amount to be paid and the currency in which payment is
25 to be made, and the name and address of the beneficiary to whom this amount is to be paid. Specifically, a web page containing a copy of the data stored in the corresponding transaction record is displayed on the paying agent's monitor 22. The paying agent, in
30 decision step 136, confirms the validity of the money transfer using the beneficiary's identification and

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transmits the following data (listed in table 4 below) in the form of a displayed web page, which, through the agent's browser, is displayed on the paying agent's monitor 22.

5

FINANCIAL INSTITUTION'S
NAME ADDRESS AND TELEPHONE NUMBER
PAYING AGENT'S
NAME, ADDRESS AND TELEPHONE NUMBER
10 PICK-UP DATE
PICK-UP TIME
CONTROL NUMBER
FUND-PICK-UP NUMBER
CUSTOMER'S
15 NAME, ADDRESS AND TELEPHONE NUMBER
BENEFICIARY'S
NAME, ADDRESS AND TELEPHONE NUMBER
IN CUSTOMER CURRENCY (e.g., US Dollars):
TRANSFERRED AMOUNT
20 TRANSACTION FEE
TOTAL AMOUNT
IN BENEFICIARY CURRENCY (e.g., Mexican
Pesos):
FUND-PICK-UP AMOUNT
25 EXCHANGE RATE
BENEFICIARY'S SIGNATURE

TABLE 4 - DISPLAYED PAYMENT DATA

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Using printer 25, in print-receipt step 145, the paying agent prints two copies of the payment receipt, which the beneficiary signs, in obtain-signature step 147. In make-payment step 148, the paying agent gives the beneficiary the transferred amount of money along with one copy of the payment receipt. After the beneficiary receives the funds and the receipt, in receive-funds step 149, fund-pick-up process 130 ends in step 140.

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The selling agents preferably deposit the funds they collect into a specified bank account for transmission to financial institution 12. In turn, the institution typically distributes funds to the paying agents by, for example, crediting an account or issuing a check. Of course, the invention contemplates that numerous procedures are available for clearing accounts, i.e., for collecting funds from and paying funds to the paying and selling agents.

In those instances where a beneficiary fails to collect funds within a particular time, e.g., thirty days, server 11 is programmed to automatically cancel the transaction. For instance, the server cancels the transaction, by, for example, changing the contents of the STATUS field (field 52) from "OPEN" to "EXPIRED". At that time, institution 12 informs the customer, via mail or telephone, that the beneficiary failed to pick-up the funds and that the transaction expired. In addition, at that time, arrangements may be made to, e.g., issue a refund to the customer.

FIG. 9 depicts a block diagram of client computer (PC) 21 located at either a selling or paying agent, and which is used in implementing the present invention.

As shown, client computer 21 comprises input interfaces (I/F) 910, processor 920, communications interface (COMM I/F) 930, memory 950 and output interfaces 970, all conventionally interconnected by

bus 940. Memory 950, which generally includes
different modalities, including illustratively random
access memory (RAM) 953 for temporary data and
instruction store, diskette drive(s) 957 for exchanging
5 information, as per user command, with floppy
diskettes, and non-volatile mass store 960 that is
implemented through a hard disk, typically magnetic in
nature. Mass store 960 may also contain a CD-ROM or
other optical media reader (not specifically shown) (or
10 writer) to read information from (and write information
onto) suitable optical storage media. The mass store
stores operating system (O/S) 963 and application
program 967; the latter implementing client processing
used in the present invention. O/S 963 may be
15 implemented by any conventional operating system, such
as the WINDOWS NT operating system ("WINDOWS NT" is a
registered trademark of Microsoft Corporation of
Redmond, Washington). Given that, we will not discuss
any components of O/S 963 as they are all irrelevant.
20 Suffice it to say, application program 967 executes
under control of the O/S.

Incoming information can arise from two
illustrative external sources: network supplied
25 information, e.g., from Internet 30 and/or other packet
networked facility, through network connection 935 to
communications interface 930, or from a dedicated input
source, via path(es) 905, to input interfaces 910.
Here, dedicated input can arise from swipe card
30 reader 43, in those agent sites that employ both that

reader and a client computer for accessing server 11
(see FIG. 1) through an Internet connection.

Input interfaces 910 contain appropriate
5 circuitry to provide necessary and corresponding
electrical connections required to physically connect
and interface card reader 43 (as well as any other
dedicated input devices, not shown) to client
computer 21. Under control of the operating system,
10 application program 967 may exchange commands and data,
via network connection 935 to server 11, or
path(es) 905 with terminal 14, to transmit and receive
information, to the extent needed, during transaction
processing.

15 Input interfaces 910 also electrically
connect and interface user input device 980, such as
keyboard 23 and mouse 24, to the client computer.
Display 22, such as a conventional color monitor, and
20 printer 25, such as a conventional laser printer used
as a transaction printer, are connected, via leads 973
and 975, respectively, to output interfaces 970. The
output interfaces provide requisite circuitry to
electrically connect and interface the display and
25 printer to the computer system.

Furthermore, since the specific hardware
components of client computer 21 as well as all aspects
of the software stored within memory 950, apart from
30 the various software modules, as discussed below, that
implement the present invention, are conventional and

well-known, they will not be discussed in any further detail.

As noted above, the present invention is susceptible of implementation in a client-server environment where either or both a selling and paying agent utilize client computer 21 to access server 11, either through a dial-up telephonic connection or an Internet web-based connection.

In that regard, FIG. 10 depicts a high-level block diagram of the software processes utilized by the present invention in a client-server embodiment with PSTN-based communication occurring between an agent and server 11. The same basic methodology described below in connection with this figure applies to use of a POS terminal, e.g., terminal 14, in lieu of a client PC.

As shown, application program 967 executing within client computer 21 contains client transaction process 1010, card reader interface process 1020 and communication (COMM) process 1030. The client computer, when accessing server 11 at the financial institution, establishes a dial-up circuit-switched connection, through local modem 1040, communication line 1045, PSTN 19 and communication line 1055, to peer modem 1060 situated within the financial institution and connected to server 11. Though server 11 may utilize quite a number of modems in order to handle a relatively large number of transactions involving quite a number of different agents, for purposes of

transaction server 1070, which, in turn and operating
in conjunction with database manager 1075, accesses the
corresponding transaction card record from transaction
database 32. If this record exists, i.e., the card is
5 valid, transaction server 1070 transmits a suitable
access-successful/activation-start message back to
client computer 21 and specifically to client
transaction process 1010 executing thereat. In
response to this message, process 1010 displays a
10 transaction template containing various fields through
which the agent queries the customer for customer and
beneficiary information, as delineated above. Once the
agent signifies, again through use of an appropriate
soft-selection key, that all the information is
15 entered, process 1010 then transmits this information
through the dial-up connection, then existing between
client computer 21 and server 11, and particularly to
transaction server 1070 situated within server 11.
Upon receipt of this information, server 1070 updates
20 the transaction card record for this transaction card
with the information supplied by the agent and also
updates the card record to signify that that particular
transaction card is now activated and ready for
subsequent use in transferring funds between the
25 customer and his(her) designated beneficiary. Once the
transaction card record has been so updated and the
card activated, transaction server 1070 broadcasts a
suitable card-activated/complete message back to client
computer 21, and specifically to client transaction
30 process 1010. Process 1010 provides a visual
notification to the agent that the card is now

activated, who, in turn, can appropriately notify the customer.

Should the agent select a money transfer
5 initiation instead of a card activation, process 1010
displays an appropriate data entry screen to prompt the
agent to enter a transaction card number, either
manually or by swiping a transaction card then
presented by a customer. Once this number is obtained,
10 process 1010 again establishes a dial-up connection to
server 11 and within this server to transaction
server 1070. After this connection is established,
process 1010 transmits the card number and transaction
type (here, card activation) to server 1070 which, in
15 turn, accesses the transaction card record for this
customer and, if the card number is valid, transmits,
within a money-transfer/start message, the customer and
beneficiary information in this record back to the
client transaction process 1010. In response to this
20 information, process 1010 displays an appropriate
display screen containing monetary fields, both in
terms of a payment amount and a currency. The agent
asks the customer for the amount of the payment to be
made. This information, as supplied by the customer,
25 is then manually entered by the agent into the client
computer and displayed by process 1010 in the display
screen, and then, once confirmed by the agent,
communicated, in a suitable money-transfer/amount
message, to the transaction server. In response, the
30 transaction server specifies the transaction fee for
the transfer and transmits this amount, in a

money-transfer/total-amount message, back to the client transaction process 1010. Once the agent has collected the proper amount of funds from the customer, the agent completes initiation of the transaction by confirming the transaction to the client computer, again through depression of an appropriate soft-key. In response, process 1010 transmits this confirmation, as a money-transfer/confirm message, to the server, specifically transaction server 1070, which, in turn, creates a corresponding transaction record, within database 32, for this card and the customer and his(her) beneficiary, in the manner described above and populates that record with information pertinent to that particular transaction. Once this occurs, the transaction server supplies transaction information, through a money-transfer/accept message, back to process 1010 with an instruction to print a two-part transaction receipt, as shown in Table 3 above, for the customer to sign and which provides the folio number for this transaction.

To effectuate payment to a beneficiary, process 1010, through selection of this particular type of transaction, displays a different display screen through which the agent asks the beneficiary for a folio number. As discussed above, this number is unique to each transaction. Once the beneficiary provides this number to the agent, the agent completely enters it and process 1010 locally displays it on monitor 22, the agent then instructs process 1010, again through depression of an appropriate soft-key to

establish a dial-up circuit switched connection,
through communication process 1030 and modem 1040, to
server 11, and then to transmit a payment transaction
initiation message containing this folio number and a
5 transaction type (here, payment) to transaction
server 1070. In response to this number, server 1070
accesses database 32 to locate a transaction record
bearing this folio number. Once this record is located
and accessed, server 1070 transmits payment and
10 beneficiary information, within a payment-info message,
back to client transaction process 1010. Process 1010
then displays this information on monitor 22. At this
point, the paying agent requests personal
identification from the beneficiary. If the agent is
15 satisfied by the identification, the agent confirms the
transfer through client process 1010, again through
depression of an associated soft-key. In response to
this confirmation, process 1010 sends a payment-confirm
message to transaction server 1070 which, in turn,
20 updates, in the manner described above, the transaction
record for this transaction to signify that payment was
made and hence the transaction is "closed-out". Once
this update occurs, server 1070 sends, via a
payment-receipt message, an instruction back to client
25 transaction process 1010 to print a two-part
transaction receipt, containing the information shown
in Table 4 above, for the beneficiary to sign prior to
actual receipt of the transferred funds.

30 To provide increased security against
third-party interception, client process 1010 and

transaction server 1070 can each employ appropriate cryptographic processing, such as, e.g., public key cryptography (where each agent is assigned a different public/private key pair by the financial institution with that pair being programmed into application program 967 used by that agent), or symmetric-key cryptography. With public key cryptography, the transaction server uses a public key assigned to a given agent for encrypting transaction information destined to the client computer used by that agent, while that agent uses his(her) own secret key for decrypting messages it so receives from the server. The server utilizes its own public-private key pair in a similar manner. With a symmetric key, the same key is used for both encryption and decryption and is kept secret and secure by both the client computer and the transaction server.

FIG. 11 depicts a high-level block diagram of the software processes utilized by the present invention also in a client-server embodiment but with web-based communication between an agent and server 11.

Here, web browser 1110 takes the place of client transaction process 1010 shown in FIG. 10; financial institution 12 contains a web server (composed of HTTP server 1170 and transaction server 1180) rather than just transaction server 1070 alone. Since the basic client-server transaction processing, apart from the use of web-based messaging, for card activation, money transfer initiation and

data entry fields in each page, and, through the browser, transmits HTTP requests containing the information back to the server. The agent can also specify the type of transaction desired to the transaction server through appropriate interaction, such as mouse clicks over corresponding display "widgets", with an initial (or home) and/or other web page(s) supplied by server 1180, as well as provide other transaction instructions and/or confirmations to transaction server 1080.

HTTP server 1170 implements a hypertext transfer protocol (HTTP) which is used, by both browser 1110 and transaction server 1180, to transport messages, here financial information and related instructions, over the Internet between the browser and server 1180. Both browser 1110 and HTTP Server 1170 implement both sides of this protocol, including packet encapsulation (assembly) as well as packet dis-assembly. In addition, this server through the use of conventional HTTP GET and POST messages issued by the browser or server manages information flow between browser 1110 and transaction server 1180 to either, as requested by the browser or the transaction server, supply information from database 32 to the browser for local display thereat or update this database with information supplied by the browser.

A transaction card number for a customer can also be supplied through card reader 43, by the agent swiping the card, but with card reader interface

process 1130 supplying that information to
browser 1110. Browser 1110 can be modified, in a
manner readily apparent to those skilled in the art,
through addition of, e.g., an appropriate
5 JAVA-implemented routine to properly interact with
process 1130 and therethrough obtain transaction card
data from card reader 43.

For added security, transaction messages may
10 be protected, through encryption, using conventional
SSL (secure socket library) based cryptography in
conjunction with HTTP. At the start of a session
(here, a transaction session between client computer 21
and server 11), SSL undertakes client-server
15 negotiations to negotiate a particular session key and
a cryptographic algorithm, such as an RSA public-key
cryptosystem, for both the client and server to use
during that session. Once the negotiations conclude,
the remaining messages are so encrypted, and
20 communicated in encrypted form, via HTTP packets,
during that session using the negotiated key and the
algorithm. This encryption and decryption would be
handled by browser 1110 and, e.g., HTTP server 1180.
SSL is currently used, on a widespread basis, for
25 providing security for Internet-based credit card
transactions. Advantageously, SSL does not encrypt
HTTP transport layer (i.e., TCP port numbers) fields
hence allowing use of load balancing servers (as shown
in FIG. 12) at the financial institution to distribute
30 transaction traffic to a given server. For further
information on SSL, the reader is directed to, e.g.,

pages 279 and 474-475 of D. Atkins et al, Internet Security - A Processional Reference, (© 1996, New Riders Publishing Co.).

FIG. 12 depicts a high-level block diagram of typical server farm 1200 for use in lieu of server 11 for processing large numbers of simultaneously occurring financial transactions.

Here, rather than utilizing just one transaction server 1180, as shown in FIG. 11, server farm 1200, shown in FIG. 12, contains multiple HTTP servers 1170₁, 1170₂, ..., 1170_x, and corresponding transaction servers 1180₁, 1180₂, ..., 1180_x. To provide secure server connectivity, communication device 1155 is connected to conventional firewall 1160 (though of larger capacity than that shown in FIG. 11, but otherwise identical in function). The firewall, in turn, is connected, as shown in FIG. 12, to load balancing server 1210 which distributes new financial transactions to a lightest-loaded HTTP server and transaction server pair in the server farm that is then available to process that transaction. Database 32 permits concurrent access by all the individual transaction servers. However, appropriate and conventional database locking mechanisms are used by the database managers (not shown) in the transaction servers to prevent inadvertent data corruption that would otherwise result from multiple simultaneous accesses being made, by multiple transaction servers, to the same record in the database.

The invention contemplates numerous variations and modifications that will be apparent to those skilled in the art in view of the above description. For instance, card activation and distribution may occur in a number of suitable ways. As described above with respect to card distribution and activation process 39, before giving a customer a transaction card, a selling agent swipes the card in magnetic strip reader 15 (see transmit-data step 83 in FIG. 6). At that point, money-transfer system 10 learns of the existence of that card. In response, server 11 creates a record in database 32 (see record-data step 84). As an alternate procedure, institution 12 could simply record the cards as generic cards with no designation of a selling agent's ID in SELLING AGENT field (field 53). Institution 12 could also load the selling agent's ID into SELLING AGENT (field 53) before distributing transaction cards to the selling agents.

The invention also contemplates that, rather than having a selling agent participate in the card activation process, e.g., via steps 86-90, institution 12 could utilize customer service representatives (CSR) for that purpose. When using a CSR, a customer with a non-activated card 95 could telephone a card center and read the card number 96 from the front face of card 95 to a CSR. Using card number 96, the CSR would then access the record for the corresponding transaction card, e.g., record C1, through server 11. The CSR would then ask the customer

to provide the customer and beneficiary information
(and possibly, the selling agent's ID), which the CSR
loads into CUSTOMER DATA (fields 56) and BENEFICIARY
DATA (fields 57) (and possibly, SELLING AGENT
5 (field 54). In addition, the CSR would set
DISTRIBUTION FLAG (field 54) and ACTIVATION FLAG
(field 55) at this time.

The invention further contemplates that
10 selling-agent sites S1-Sn and paying-agent sites P1-Pm
may be located at airports, banks, department and
convenience stores, liquor stores, travel agencies, and
the like. In some instances, selling and paying agents
may be located at the same site. However, paying-agent
15 sites P1-Pm would best include conveniently located
establishments that normally have considerable amounts
of cash that they would prefer not having on hand, a
requirement that is not applicable to selling agents.
However, a selling agent can also function as a paying
20 agent.

Because security is a critical issue in
money-transfer systems, other, more secure, payment
methods may be desirable. For example, a paying agent
25 may electronically credit the delivered funds to a
beneficiary's bank account, rather than rely on
physical delivery of cash to a beneficiary.
Alternatively, a paying agent's printer 25 may print a
check, in favor of the beneficiary, at the time that
30 the payment receipt prints (see print-receipt step 145
in FIG. 8) for subsequent access, in a "piece-meal"

fashion, if desired, by the beneficiary. Still further, paying agents may make the funds available to a beneficiary through an automatic teller machine, which the beneficiary can deposit or negotiate, as desired.

To assist with security, institution 12 may issue secret personal-identification numbers (PIN's) to selling agents and their employees. Thus, when a selling agent initiates a transaction on behalf of a customer (see input-data step 102 in FIG. 7), institution 12 may require a selling agent to enter two numbers. For example, a selling agent might be required to enter, via keypad 16, a selling agent PIN and an employee PIN, to differentiate different employees working for the same selling agent. Requiring entry of PIN's could increase the difficulty of operating data terminal 14 on an unauthorized basis. Alternatively, each such terminal could be fitted with a processor programmed to store and automatically transmit an agent's ID, PIN and/or a terminal tracking number, whenever a data transmission occurs.

As a security measure and as a possible marketing inducement, selling agents may provide customers with a telephone PIN when initiating a transaction. The customer would then have the option of using the telephone PIN to promptly make a toll-free call to the beneficiary from the selling agent's site. It is felt that prompt disclosure of a folio number and an amount to a beneficiary would enhance security as

well as provide additional convenience to the beneficiary.

5 The above illustrative description shows a
single beneficiary listed for each transaction card 95.
However, cards 95 may also be issued with more than one
beneficiary. A selling agent may select, via
10 keyboard 16, whether one, more or all of the recorded
beneficiaries are to pick-up or otherwise receive the
funds. In fact, the appropriate transaction card
record C1-Cr may name the customer as one of the
beneficiaries or the only beneficiary. In that case, a
customer, who may be traveling to a distant location,
would not need to carry a large amount of cash or
15 traveler's checks. A traveler could arrange to have a
folio number available to collect money in a local
currency upon arrival at a foreign location.

20 Although various embodiments which
incorporate the teachings of the present invention have
been shown and described in detail herein, those
skilled in the art can readily devise many other
embodiments, modifications and applications of the
present invention that still utilize the inventive
25 teachings.